ASSEMBLY, INSTALLATION, AND REMOVAL OF CONTACTS AND MODULES

FOR QUADRAPADDLE™ SIGNAL CONTACTS AND MODULES

TABLE OF CONTENTS

QUADRAPADDLE™ SIGNAL RECEIVER CONTACT ASSEMBLY

PART # 610 138 116

TOOLS REQUIRED
Crimp Tool, Part # 910 101 125

Dimensions shown: [millimeters]
inches

CRIMP TOOL SETUP

1. Using the Crimp Tool, Part # 910 101 125 (**Figure A**), with the wire gauge numbers facing you, squeeze the tool handles together until the ratchet releases; this will open the tool.

2. Place the contact into the crimp die cavity from the rear side of the tool. The contact crimp areas will be facing you. Move the contact up to align the contact on the insulation stop (**Figure B**). Place contact into the correct wire cavity (24-28 AWG on the left, 22-24 AWG on the right) according to the wire gauge size in **Table 1**. Squeeze the crimp handles until ratchet clicks one time to hold contact in place.

CONTACT SETUP AND CRIMPING

1. Determine the strip length according to wire gauge (**Table 1**). Strip wire (**Figure C**).

2. Insert the wire through the insulation stop and into the wire barrel of the contact until it stops against the insulation stop.

3. Holding the wire in place, squeeze the handles together until the tool is completely closed. Continue squeezing, until the last click, to allow the handle to release fully. Remove the contact from the cavity (**Figure D**). The conductor shall be visible on both ends of the conductor crimp. The insulation crimp should grip securely around the wire insulation without deforming the insulation.

4. Check to make sure the wire meets the minimum pullout force shown in **Table 1** and the wire and insulation barrel are within the height and width specifications. Measure the crimp height with an anvil and point micrometer.

Figure A. Crimp Tool, Part # 910 101 125.

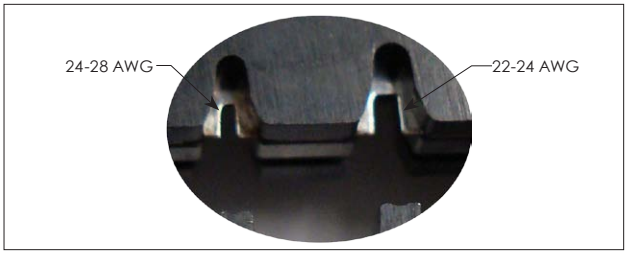


Figure B. Insulation stop on crimp tool. Note: Larger diameter 24 AWG wire, greater than 0.04" should be crimped using the 22-24 crimp die.

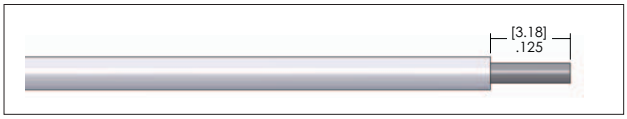


Figure C. Correctly stripped wire.

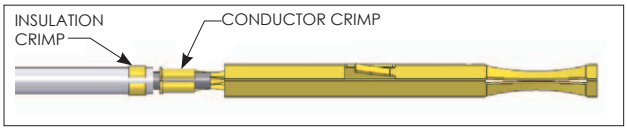


Figure D. Correctly crimped contact.

Table 1.

WIRE SIZE, AWG	CRIMP TOOL	LOCATOR DIE	STRIP LENGTH IN [MM]	INSULATION DIAMETER MAX (IN [MM])	WIRE BARREL CRIMP MAX (IN [MM])	PULLOUT FORCE (LBS [N])	EXTRACTION TOOL
22	910 101 125	N/A	0.125 [3.18]	0.048 [1.22]	0.034 - 0.038 [0.86 - 0.96]	10 [44.5]	910110112
24*					0.032 - 0.036 [0.81 - 0.91]	8 [35.6]	
26				0.040 [1.02]	0.028 - 0.032 [0.71 - 0.81]	4 [17.8]	
28					0.024 - 0.030 [0.61 - 0.76]	2 [8.9]	
2-30*						1 [4.4]*	

**Pullout force is for individual wires.*

QUADRAPADDLE™ SIGNAL ITA CONTACT ASSEMBLY

PART # 610 138 109 / 610 138 112

TOOLS REQUIRED
Crimp Tool, Part # 910 101 103
Locator, Part # 910 104 140

CRIMP TOOL SETUP

1. Set up the Crimp Tool, Part # 910 101 103 (**Figure A**), by loosening the latch locking screw (counter-clockwise, until turning stops). Remove any previously used locator.

2. Insert the open end of the Locator, Part # 910 104 140 (**Figure B**), into the crimp tool locator retainer. Slide the retaining latch toward the locator until the locator is securely locked into place. The locator may have to be twisted to allow the latch to retain it. Tighten the latch locking screw.

CRIMP TOOL ADJUSTMENT AND WIRE PREPARATION

1. Adjust the crimp tool setting by pulling the microcrimp adjusting knob and turning it at the same time (clockwise increases, counter-clockwise decreases setting) until the desired setting is achieved on the microcrimp indicator (**Table 1**). Verify with gauge pin. For more information about gauge pins, visit vpc.com/gaugepins. See calibration instructions for Part # 910 101 102/103 for gauge pin verification instructions.

2. Determine the strip length according to wire gauge (**Table 1**). Strip wire.

CONTACT SETUP AND CRIMPING

1. Insert the contact into the crimp tool and squeeze the handle slightly to hold the contact in position for wire insertion.

2. Insert the stripped wire fully into the contact and squeeze the crimp tool handle until a positive stop is reached. The tool will release and return to a fully "open" position. Remove the crimped contact wire (**Figure C**).

NOTE: This contact can also be used to solder wire.

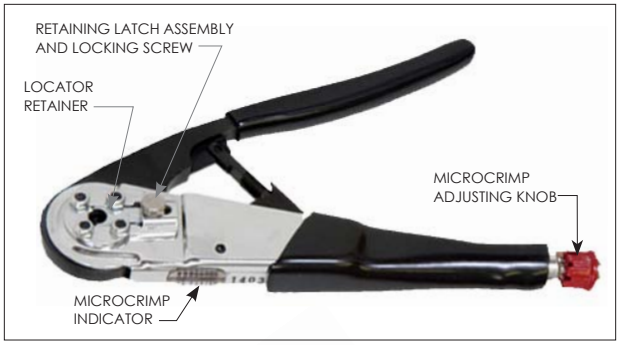


Figure A. Crimp Tool, Part # 910 101 103.

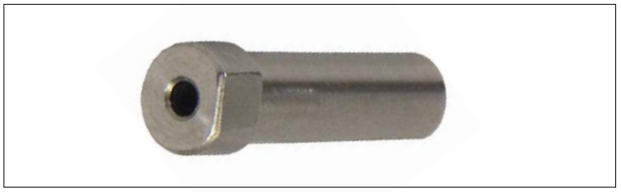


Figure B. Locator, Part # 910 104 140.

Figure C. Correctly crimped contact.

OBSERVE PRECISION RATCHET ACTION BY OPENING AND CLOSING TOOL FULLY SEVERAL TIMES. NOTE THAT THE TOOL CANNOT BE OPENED WITHOUT COMPLETING A CYCLE. NEVER ATTEMPT TO DISASSEMBLE TOOL. NEVER TIGHTEN OR LOOSEN STOP NUTS ON THE BACK OF THE TOOL.

Table 1.

CONTACT	CRIMP TOOL	LOCATOR DIE	STRIP LENGTH (IN [MM])	INSULATION DIAMETER MAX (IN [MM])	WIRE GAUGE	CRIMP SETTING (IN [MM])		PULLOUT FORCE (LBS [N])	EXTRACTION TOOL
						MAX	MIN		
610138109	910101103	910104140	0.200 [5.08]	0.040 [1.02]	22	0.030 [0.76]	0.026 [0.66]	10 [44.5]	910110111
					24	0.026 [0.66]	0.022 [0.56]	8 [35.6]	
			0.250 [6.35]		2-24*	0.030 [0.76]	0.026 [0.66]	8 [35.6]	
					2-26*	0.029 [0.74]	0.026 [0.66]	4 [17.8]	
610138112	910101103	910104140	0.200 [5.08]	0.040 [1.02]	26	0.032 [0.81]	0.031 [0.79]	4 [17.8]	
					28	0.027 [0.68]	0.026 [0.66]	2 [8.9]	
					30	0.023 [0.58]	0.022 [0.56]	1 [4.4]	

* Pullout force is for individual wires

QUADRAPADDLE SIGNAL WIRE-WRAP CONTACT TERMINATION

PART # 610 138 122 / 610 138 118

TOOLS REQUIRED
Wire Stripping Tool
Wire-wrap gun
Wire-wrap bit

ASSEMBLY INSTRUCTIONS

NOTE: VPC performs wire-wrap terminations in accordance with IPC-A-620 standards.

NOTE: Wire-wraps must be performed with solid wire. Stranded wire will not work for wire wrapping. VPC recommends 26 to 30 AWG wire.

1. Cut and strip the wire. Depending on the style of wire-wrap gun and bit used, the wire is either stripped during the wrapping process or needs to be stripped before the wrapping process.

NOTE: Refer to the user manual of your wire-wrap gun to determine in which fashion your tool operates.

2. Insert the wire into the wire slot on the wire-wrap gun. With modified and standard bits insert the wire in the wire slot as deep as possible. With C.S.W. bits the wire has to be inserted all the way through the wire slot until it goes out of the cutting window. The simplified sleeve of the manual tool has no notch.

3. Hold the wire in place by hand (**Figure A**).

4. Position the terminal hole of the wire-wrap gun on the post to be wrapped. The wire-wrap gun should be parallel with the contact. The wire must continue to be held in place by hand.

5. Engage the wire-wrap gun to wrap the wire. During the wrapping operation, gently press the tool forward onto the wire-wrap post. The turns of the connection have to be nicely wrapped against the other. Do not push too hard. Do not pull backwards. See **Figure B** for a terminated contact in a module.

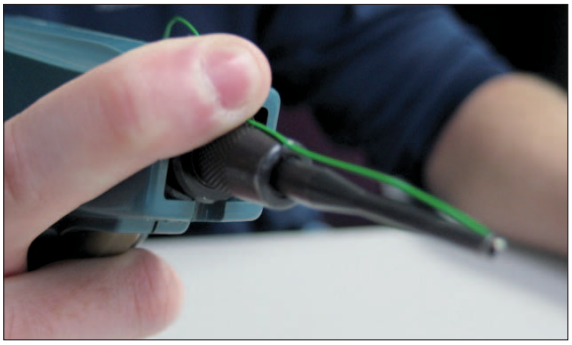


Figure A. Hold the wire in place by hand.

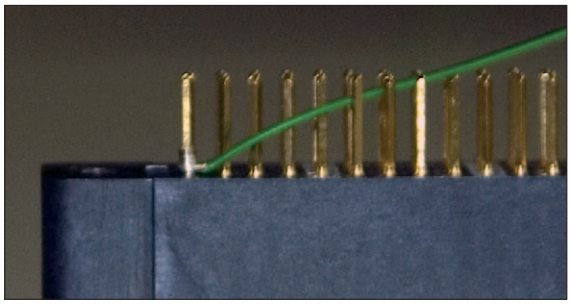


Figure B. Completed wrapped wire.

QUADRAPADDLE SIGNAL RECEIVER CONTACT INSTALLATION AND REMOVAL

PART # 610 138 116

TOOLS REQUIRED
Phillips Screwdriver
Flat Blade Screwdriver
QuadraPaddle Receiver Extraction Tool, Part # 910 110 112

CONTACT INSTALLATION INSTRUCTIONS

1. Assemble the contact to the respective wire.
   NOTE: For more information concerning the process of crimping the contact, please see contact assembly instructions in Section 1 of this User's Manual.

2. Insert the assembled contact into the back (wiring side) of the assembled module (**Figure A**). The contact can only go into one side. Ensure that the contact is squared up with the corresponding module location. Once in place, pull the wire slightly to ensure that the contact is seated.

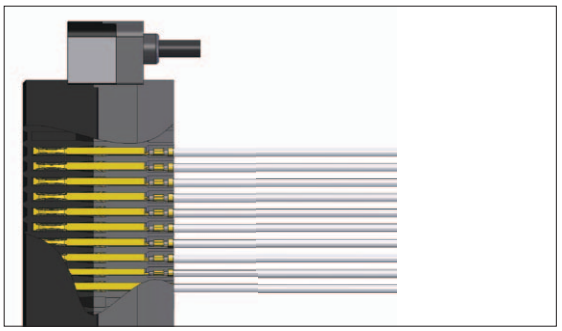


Figure A. Contacts inserted into the module.

CONTACT REMOVAL INSTRUCTIONS

1. Remove the module from the receiver frame.
   NOTE: For more information concerning the process of removing the module from the receiver frame, see module installation and removal instructions in Section 5 of this User's Manual.

2. Use a Phillips head screwdriver to remove the two 2-56 screws located at the top and bottom of the module (**Figure B**).

3. Insert the flat blade screwdriver into the slot of the module and pry the end of the module using a twisting motion until visible separation is indicated. Repeat on the opposite end of the module (**Figure B**).

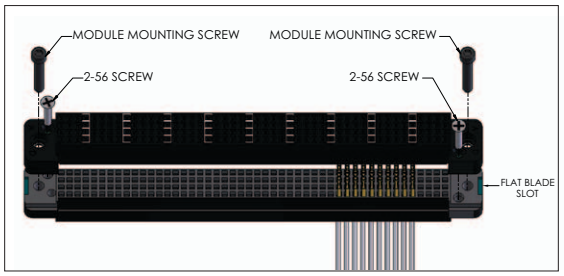


Figure B. Open both sides of the module simultaneously or pins could be damaged.

4. Grasp the module halves and apply force in opposite directions, rocking the ends of the module while slightly pulling the top of the module away from the mating bottom section. Be sure to open both sides of the module simultaneously or contacts could be damaged.

5. Place the QuadraPaddle Receiver Extraction Tool, Part # 910 110 112 (**Figure C**), over the contact to be removed/replaced. Use care to keep the tool perpendicular to the surface of the module, otherwise the tool or the contact could be bent.

6. Once the extraction tool is seated and the retaining tabs on the contact are compressed, depress the plunger. The contact will be pushed out of the rear of the module.

DO NOT DEPRESS THE PLUNGER ON THE BACK OF THE EXTRACTION TOOL UNTIL THE TIP OF THE EXTRACTION TOOL HAS FULLY SEATED INTO THE MODULE AND COMPRESSED THE RETAINING RING TABS ON THE CONTACT.

7. Replace the module cap using both hands to push the separated halves together. Replace and tighten the module retaining screws to a maximum torque of 1.5 in-lbs [0.16 Nm].

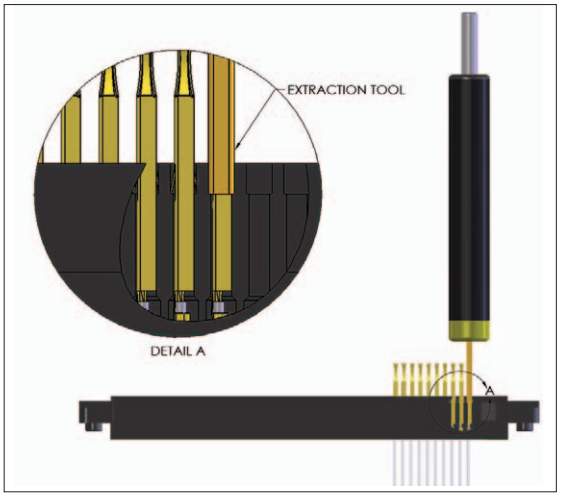


Figure C. Ensure that the tool is kept perpendicular to the module face to avoid damage to the contact or tool.

NOTE: The process shown here uses standard/90 series modules. The same process is used for modules from other series.

NOTE: If you are using a hybrid module, you may need to reference the User's Manual for the other contact type for extraction instructions.

QUADRAPADDLE SIGNAL TWIN FEMALE RECEIVER CONTACT REPLACEMENT

PART # 610 138 100

TOOLS REQUIRED
Phillips Head Screwdriver
Flat Blade Screwdriver
Tweezers or Needlenose Pliers

CONTACT REMOVAL INSTRUCTIONS

1. Remove the module from the receiver frame.
   NOTE: For more information concerning the process of removing the module from the receiver frame, see module installation and removal instructions in Section 5 of this User's Manual.

2. Use a Phillips head screwdriver to remove the two 2-56 screws located at the top and bottom of the module (**Figure A**).

3. Insert the flat blade screwdriver into the slot of the module and pry the end of the module using a twisting motion until visible separation is indicated. Repeat on the opposite end of the module (**Figure A**).

4. Grasp the module halves and apply force in opposite directions, rocking the ends of the module while slightly pulling the top of the module away from the mating bottom section. Be sure to open both sides of the module simultaneously or contacts could be damaged.

5. Use a pair of tweezers or a small pair of needlenose pliers to grasp the contact. Pull the contact out of the module, taking care to avoid damaging surrounding contacts (**Figure B**).

6. If an Adapter Pin, Part #610 138 117/118, needs to be removed, it can be taken out at this point by turning the module over, allowing the pin to fall out.

CONTACT INSTALLATION INSTRUCTIONS

1. Remove the module from the receiver frame.
   NOTE: For more information concerning the process of removing the module from the receiver frame, see module installation and removal instructions in Section 5 of this User's Manual.

2. Use a Phillips head screwdriver to remove the two 2-56 screws located at the top and bottom of the module (**Figure A**).

3. Insert the flat blade screwdriver into the slot of the module and pry the end of the module using a twisting motion until visible separation is indicated. Repeat on the opposite end of the module (**Figure A**).

4. Grasp the module halves and apply force in opposite directions, rocking the ends of the module while slightly pulling the top of the module away from the mating bottom section. Be sure to open both sides of the module simultaneously or contacts could be damaged.

5. Align the square portion of the contact with the square opening in the module. Insert the contact into the bottom half of the module (**Figure C**).

6. Use your thumb or a flat, non-marring surface to press the end of the contact into the module.

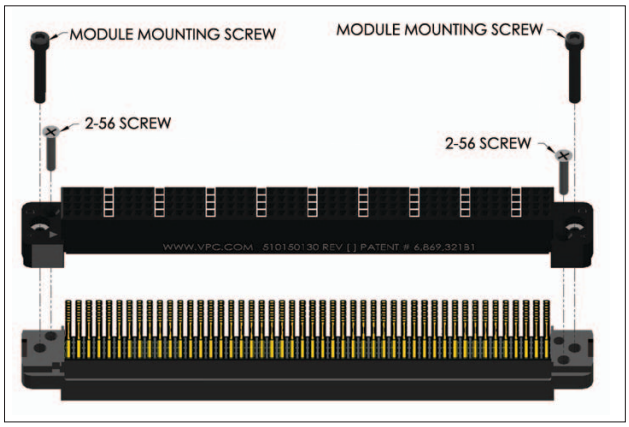


Figure A. The module is designed with a polarizing feature to make sure the cap is properly aligned.

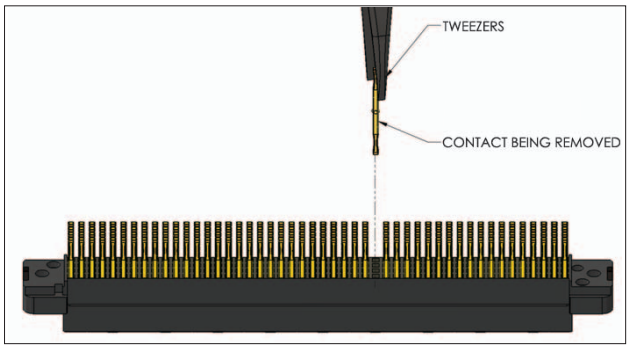


Figure B. Take care to avoid damaging contacts surrounding the one to be removed.

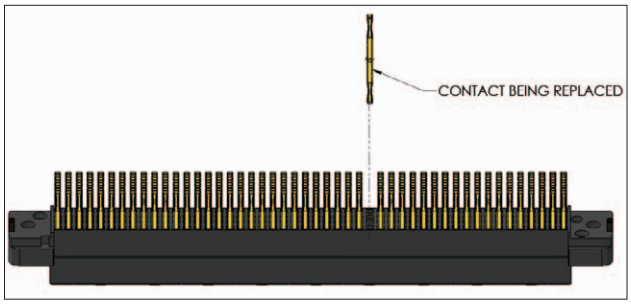


Figure C. Ensure the square portion of the contact is aligned with the square opening in the module.

7. If an Adapter Pin, Part #610 138 117/118, needs to be installed, place the pin into the protruding portion of the contact, Part # 610 138 100.

8. Replace the module cap using both hands to push the separated halves together. Replace and tighten the module retaining screws to a maximum torque of 1.5 in-lbs [0.16 Nm].

NOTE: The process shown here uses standard/90 series modules. The same process is used for modules from other series.

NOTE: If you are using a hybrid module, you may need to reference the User's Manual for the other contact type for extraction instructions.

QUADRAPADDLE SIGNAL ITA CONTACT INSTALLATION AND REMOVAL

PART # 610 138 109 / 610 138 112 / 610 138 115

TOOLS REQUIRED
QuadraPaddle ITA Extraction Tool, Part # 910 110 111

CONTACT INSTALLATION INSTRUCTIONS

1. Assemble the contact to the respective wire.
   NOTE: For more information concerning the process of crimping the contact, see contact assembly instructions in Section 2 of this User's Manual.

2. Insert the assembled contact into the back (wiring side) of the assembled module (**Figure A**). The contact can only go into one side. Once in place, pull the wire slightly to ensure that the contact is seated.

REMOVAL INSTRUCTIONS

1. Remove the module from the ITA frame.
   NOTE: For more information concerning the process of removing the module from the ITA frame, see module installation and removal instructions in Section 5 of this User's Manual.

2. Place the QuadraPaddle ITA Extraction Tool, Part # 910 110 111 (**Figure B**), over the contact to be removed/replaced. Use care to keep the tool perpendicular to the surface of the module as to not bend the tool or the contact to be removed. Rotate the tool slightly while pushing it into the counter bore on the mating side of the module.

3. Once the extraction tool is seated properly and the tabs on the retaining ring are compressed, push the plunger and the contact will be pushed out of the rear of the module.

DO NOT DEPRESS THE PLUNGER ON THE BACK OF THE EXTRACTION TOOL UNTIL THE TIP OF THE EXTRACTION TOOL HAS BEEN FULLY SEATED INTO THE MODULE AND COMPRESSED THE RETAINING RING TABS ON THE CONTACT.

NOTE: The process shown here uses standard/90 series modules. The same process is used for modules from other series.

NOTE: If you are using a hybrid module, you may need to reference the User's Manual for the other contact type for extraction instructions.

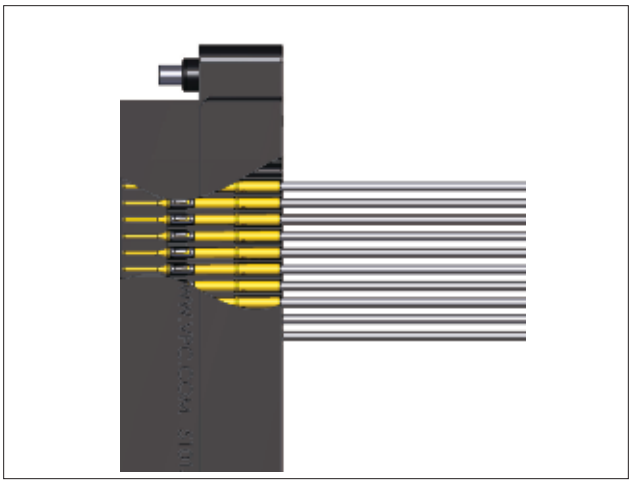


Figure A. Contacts inserted into the module.

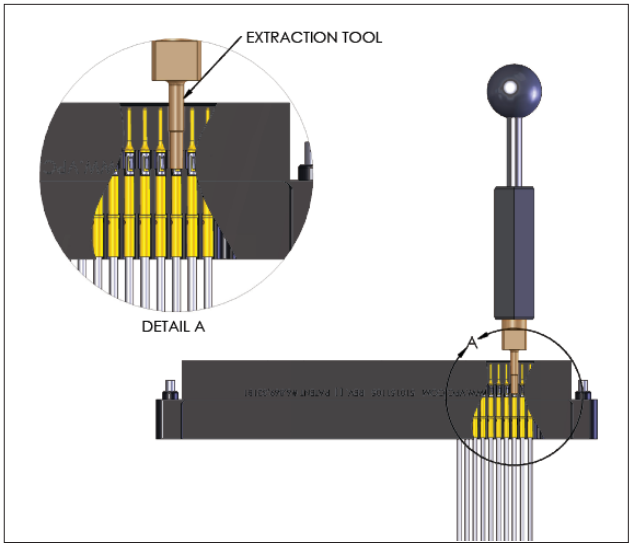


Figure B. Ensure that the tool is kept perpendicular to the module face to avoid damage to the contact or tool.

QUADRAPADDLE SIGNAL ITA FOR WIRE WRAP CONTACT INSTALLATION AND REMOVAL

PART # 610 138 122

TOOLS REQUIRED

QuadraPaddle Wire Wrap ITA Insertion Tool, Part # 910 113 106
QuadraPaddle ITA Extraction Tool, Part # 910 110 111

CONTACT INSTALLATION INSTRUCTIONS

NOTE: For information concerning the process of wrapping the contact, see contact assembly instructions in Section 3 of this User's Manual.

1. Insert the contact into the back (wiring side) of the module (**Figure A**). Make sure the contact is inserted as far as possible.

2. Place the QuadraPaddle Wire Wrap ITA Insertion Tool, Part # 910 113 106, onto the contact (**Figure B**).

3. Using the insertion tool, push the contact into the module until it is fully seated.

4. To ensure the contact is fully seated, pull on the square post lightly. If the contact is not seated, it will be pulled out of the module.

CONTACT REMOVAL INSTRUCTIONS

1. Remove the module from the ITA frame.
   NOTE: For more information concerning the process of removing the module from the ITA frame, see module installation and removal instructions in Section 5 of this User's Manual.

2. Place the QuadraPaddle ITA Extraction Tool, Part # 910 110 111 (**Figure C**), over the mating end of the contact to be removed/replaced. Use care to keep the tool perpendicular to the surface of the module as to not bend the tool or the contact to be removed. Rotate the tool slightly while pushing it into the counter bore on the mating side of the module.

3. Once the extraction tool is seated properly and the tabs on the retaining ring are compressed, push the plunger. The contact will be pushed out of the rear of the module.

DO NOT DEPRESS THE PLUNGER ON THE BACK OF THE EXTRACTION TOOL UNTIL THE TIP OF THE EXTRACTION TOOL HAS BEEN FULLY SEATED INTO THE MODULE AND COMPRESSED THE RETAINING RING TABS ON THE CONTACT.

NOTE: The process shown here uses standard/90 series modules. The same process is used for modules from other series.

NOTE: If you are using a hybrid module, you may need to reference the User's Manual for the other contact type for extraction instructions.

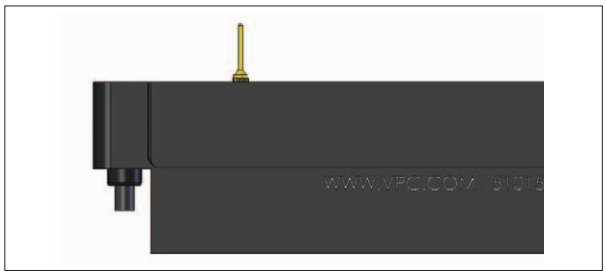


Figure A. Contact inserted into the back of the module.

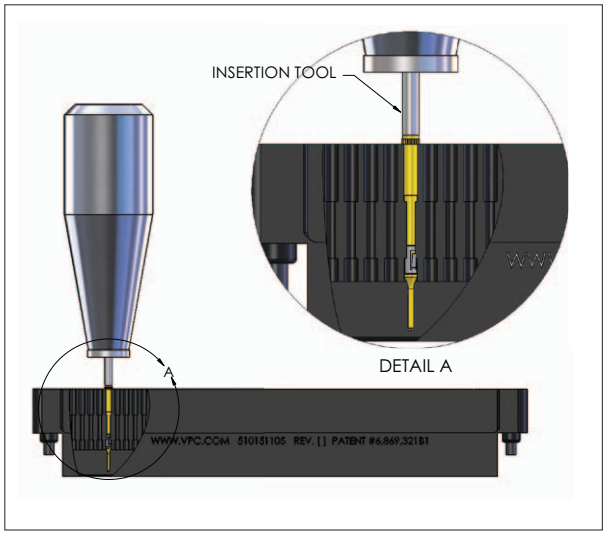


Figure B. Ensure that the tool is kept perpendicular to the module face to avoid damage to either the contact or tool.

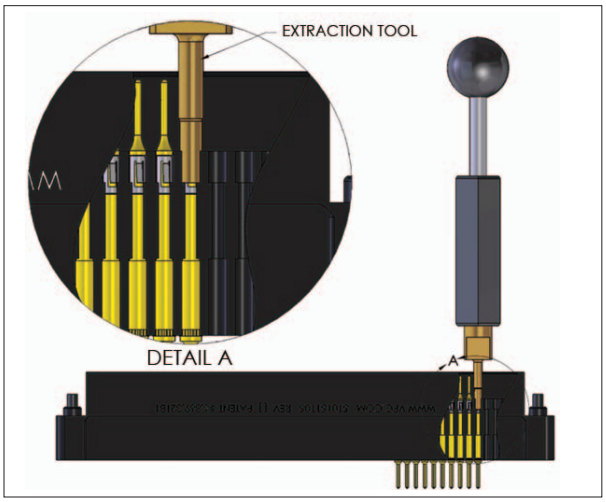


Figure C. Ensure that the tool is kept perpendicular to the module face to avoid damage to the contact or tool.

QUADRAPADDLE SIGNAL STANDARD/90 SERIES MODULE INSTALLATION AND REMOVAL

TOOLS REQUIRED
$^{3}/_{32}$ Allen Wrench

INSTALLATION INSTRUCTIONS

1. Place the module in the receiver or ITA until the upper and lower module screws touch the mating holes in the inner frame. Ensure that Position 1 is located at the top for systems in which the modules are oriented vertically or to the left for systems in which the modules are oriented horizontally.

2. Using a $^{3}/_{32}$ Allen wrench, tighten the top screw 1 to 2 full revolutions, while pushing lightly against the face of the module.

3. Maintain this pressure while tightening the bottom screw 1 to 2 full revolutions.

4. Repeat this sequence until the module is seated. Torque the screw to 4 in-lbs [0.45 Nm].

REMOVAL INSTRUCTIONS

1. To remove, loosen the top screw 1 to 2 full revolutions. Loosen bottom screw 1 to 2 full revolutions.

2. Repeat this sequence until the module is separated from the receiver or ITA.

NOTE: For optimum performance and system longevity, distribute the contact load evenly throughout the module.

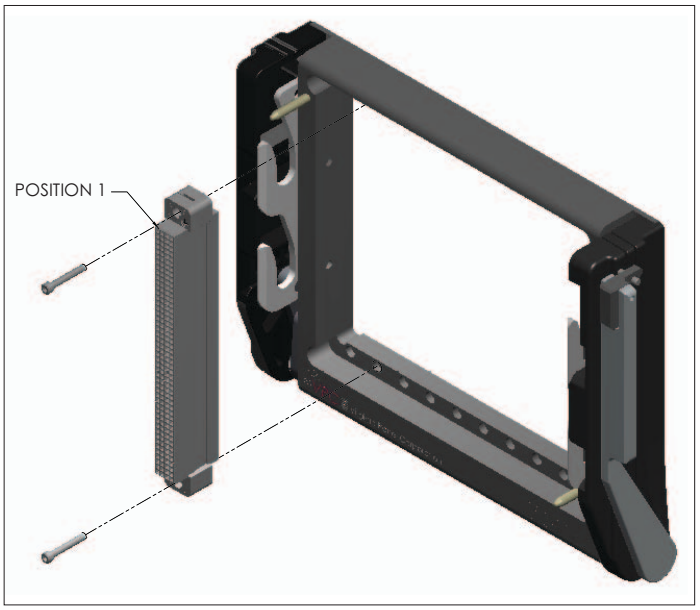


Figure A. Receiver Module.

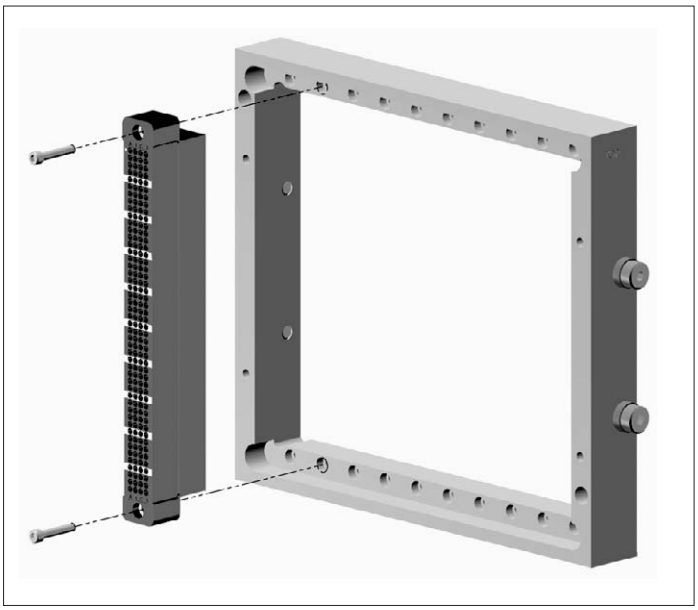


Figure B. ITA Module.

QUADRAPADDLE SIGNAL ICON MODULE INSTALLATION AND REMOVAL

TOOLS REQUIRED
Phillips Head Screwdriver

INSTALLATION INSTRUCTIONS
NOTE: The receiver strain relief plate or the ITA cover may need to be removed prior to installing or removing an iCon module. Please refer to the appropriate User's Manual for instructions on how to perform these steps.

1. Place the module in the receiver or ITA until the upper and lower module screws touch the mating holes in the frame. Install modules such that Position 1 is located at the top of the ITA/ receiver frame.

2. Using a Phillips head screwdriver, tighten the top screw 1 to 2 full revolutions, while pushing lightly against the face of the module.

3. Maintain this pressure while tightening the bottom screw 1 to 2 full revolutions.

4. Repeat this sequence until the module is seated. Torque the screw to 1.5 in-lbs [0.16 Nm].

REMOVAL INSTRUCTIONS
1. To remove, loosen the top screw 1 to 2 full revolutions. Loosen bottom screw 1 to 2 full revolutions.

2. Repeat this sequence until the module is separated from the receiver or ITA.

NOTE: For optimum performance and system longevity, distribute the contact load evenly throughout the module.

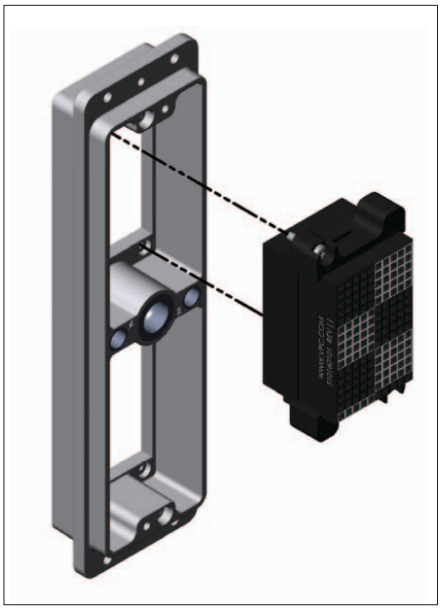


Figure A. Receiver Module.

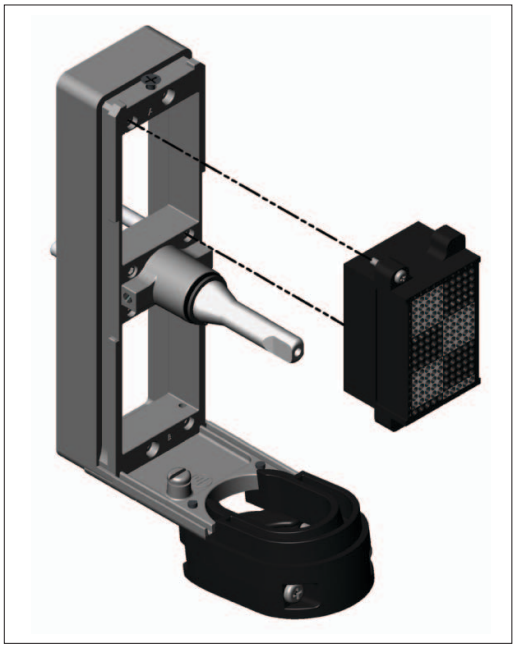


Figure B. ITA Module.

QUADRAPADDLE SIGNAL RECEIVER PCB ADAPTER INSTALLATION AND REMOVAL

PART # 510 150 125 / 510 150 126 / 510 150 127 / 510 150 128 /
510 150 141 / 510 150 142 / 510 150 148 / 510 150 155

TOOLS REQUIRED
3/32 Allen Wrench

PCB ADAPTER INSTALLATION AND REMOVAL INSTRUCTIONS

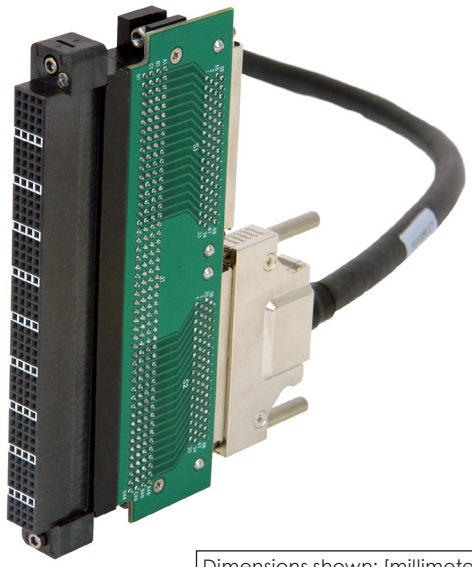
1. Using the supplied 3/32 Allen wrench, install the receiver module into the receiver frame with the two 4-40 x 1¼" screws. Note that the screws will extend approximately 0.75" to 1.0" [19-25 mm] beyond the rear of the receiver frame. Ensure that Position 1 is located at the top for systems in which the modules are oriented vertically or to the left for systems in which the modules are oriented horizontally (**Figure A**).

2. Access the rear of the receiver frame and install the 4-40 stand-offs to the 4-40 X 1¼" module retaining screws according to **Table 1** (**Figure B**).

3. Align the PCB adapter's two threaded retaining sockets with the 4-40 x 1¼" module retaining screws with stand-offs installed (**Figure C**). Ensure that Position 1 on the adapter corresponds with Position 1 on the module.

4. Using the 3/32 Allen wrench, carefully install the PCB adapter by tightening the retaining sockets, turning each no more than 1½ to 2 full revolutions before alternating to the other socket. Repeat this step until the PCB adapter is firmly engaged with the receiver module, taking care not to over-tighten, maximum torque of 4 in-lbs [0.45 Nm].

5. To remove the PCB adapter from the receiver frame and module, use the same alternating method of 1½ to 2 turns until the PCB adapter is fully disengaged.



Dimensions shown: [millimeters]
inches

Table 1.

RECEIVER FRAME STYLE	RECEIVER FRAME THICKNESS	STAND-OFF CONFIGURATION	ITEMS TO BE USED
9025, 9025TR, 9050, 9075, SL4, S6, G12, and G12x	0.545 [13.84]	⅛" [3.18 mm] stand-off per mounting screw	Item ❶
Small 90 Series (3,6,10), G2, G6, G10, and G18 (NON-PCB)	0.365 [9.27]	5/16" [7.94 mm] stand-off per mounting screw	Item ❷
G10 (PCB) and G18 (PCB)	0.250 [6.35]	Both ⅛" [3.18 mm] and 5/16" [7.94 mm] stand-off per mounting screw	Item ❶❷

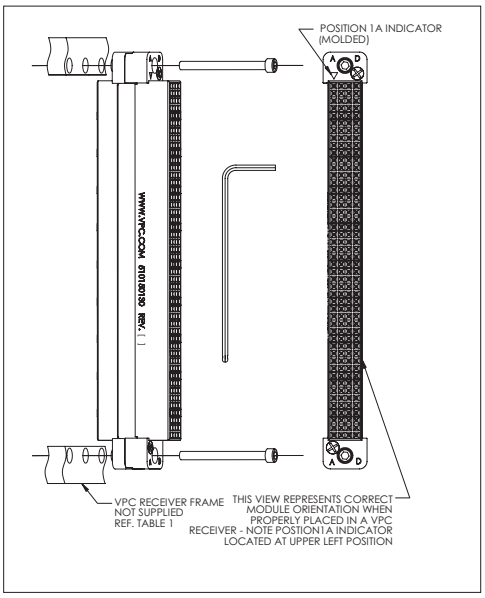


Figure A. Install receiver module onto receiver frame.

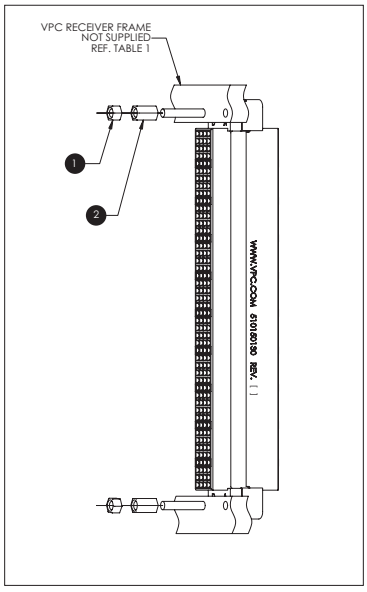


Figure B. Install proper stand-off.

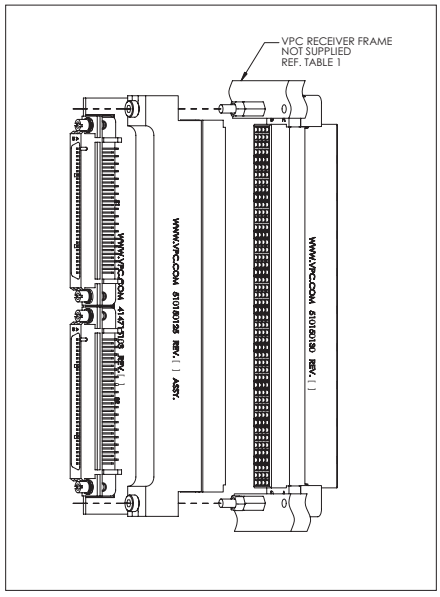


Figure C. Install PCB adapter.

QUADRAPADDLE SIGNAL CUSTOM RECEIVER PCB ADAPTER INSTALLATION AND REMOVAL

PART # 510 150 152 / 510 109 315

TOOLS REQUIRED
3/32 Allen Wrench

PCB ADAPTER INSTALLATION AND REMOVAL INSTRUCTIONS

1. Solder the header to PCB (IPC-A-610 standard is recommended for PCB design). The PCB must be manufactured with the header installation area complying with recommended PCB layout (**Figure A**).

2. Fasten the shroud assembly to the PCB using two 2-56 x .25 flat head screws (**Figure B on next page**). Torque screws to 2 in-lbs [0.22 Nm].

3. Using the supplied 3/32 Allen wrench, install the receiver module into the receiver frame with the two 4-40 x 1¼ screws. Torque screws to 4 in-lbs [0.45 Nm]. Note that screw will extend approximately 0.75"-1.0" [19-25 mm] beyond the rear of the receiver frame. Ensure that Position 1 is located at the top for systems in which the modules are oriented vertically or to the left for systems in which the modules are oriented horizontally.

Continued on next page...

Dimensions shown: [millimeters]
inches

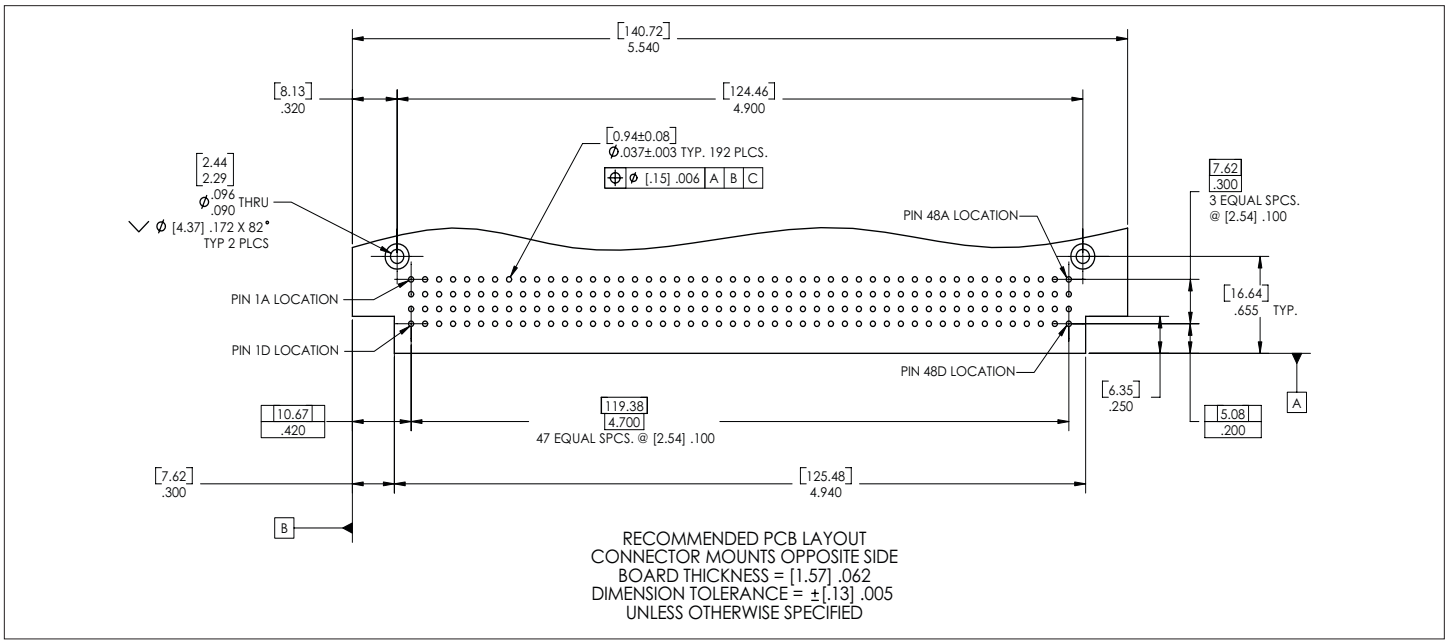


Figure A. Recommended PCB layout.

QUADRAPADDLE SIGNAL CUSTOM RECEIVER PCB ADAPTER INSTALLATION AND REMOVAL

PART # 510 150 152 / 510 109 315

PCB ADAPTER INSTALLATION AND REMOVAL INSTRUCTIONS, CONTINUED

4. Access the rear of the receiver frame and install the 4-40 stand-offs to the 4-40 X 1¼" module retaining screws according to **Table 1** (**Figure B**).

5. Align the PCB adapter's two threaded retaining sockets with the 4-40 x 1¼" module retaining screws with stand-offs installed (**Figure B**). Ensure that Position 1 on the adapter corresponds with Position 1 on the module.

6. Using the $^{3}/_{32}$ Allen wrench, carefully install the PCB adapter by tightening the retaining sockets, turning each no more than 1½ to 2 full revolutions before alternating to the other socket. Repeat this step until the PCB adapter is firmly engaged with the receiver module, taking care not to over-tighten. Torque screws to 4 in-lbs [0.45 Nm].

7. To remove the PCB adapter from the receiver frame and module, use the same alternating method of 1½ to 2 turns until PCB assembly is fully disengaged.

Dimensions shown: [millimeters]
inches

Table 1.

RECEIVER FRAME STYLE	RECEIVER FRAME THICKNESS	STAND-OFF CONFIGURATION	ITEMS TO BE USED
9025, 9025TR, 9050, 9075, SL4, S6, G12, and G12x	0.545 [13.84]	⅛" [3.18 mm] stand-off per mounting screw	Item ❶
Small 90 Series (3,6,10), G2, G6, G10, and G18 (NON-PCB)	0.365 [9.27]	$^{5}/_{16}$" [7.94 mm] stand-off per mounting screw	Item ❷
G10 (PCB) and G18 (PCB)	0.250 [6.35]	Both ⅛" [3.18 mm] and $^{5}/_{16}$" [7.94 mm] stand-off per mounting screw	Item ❶❷

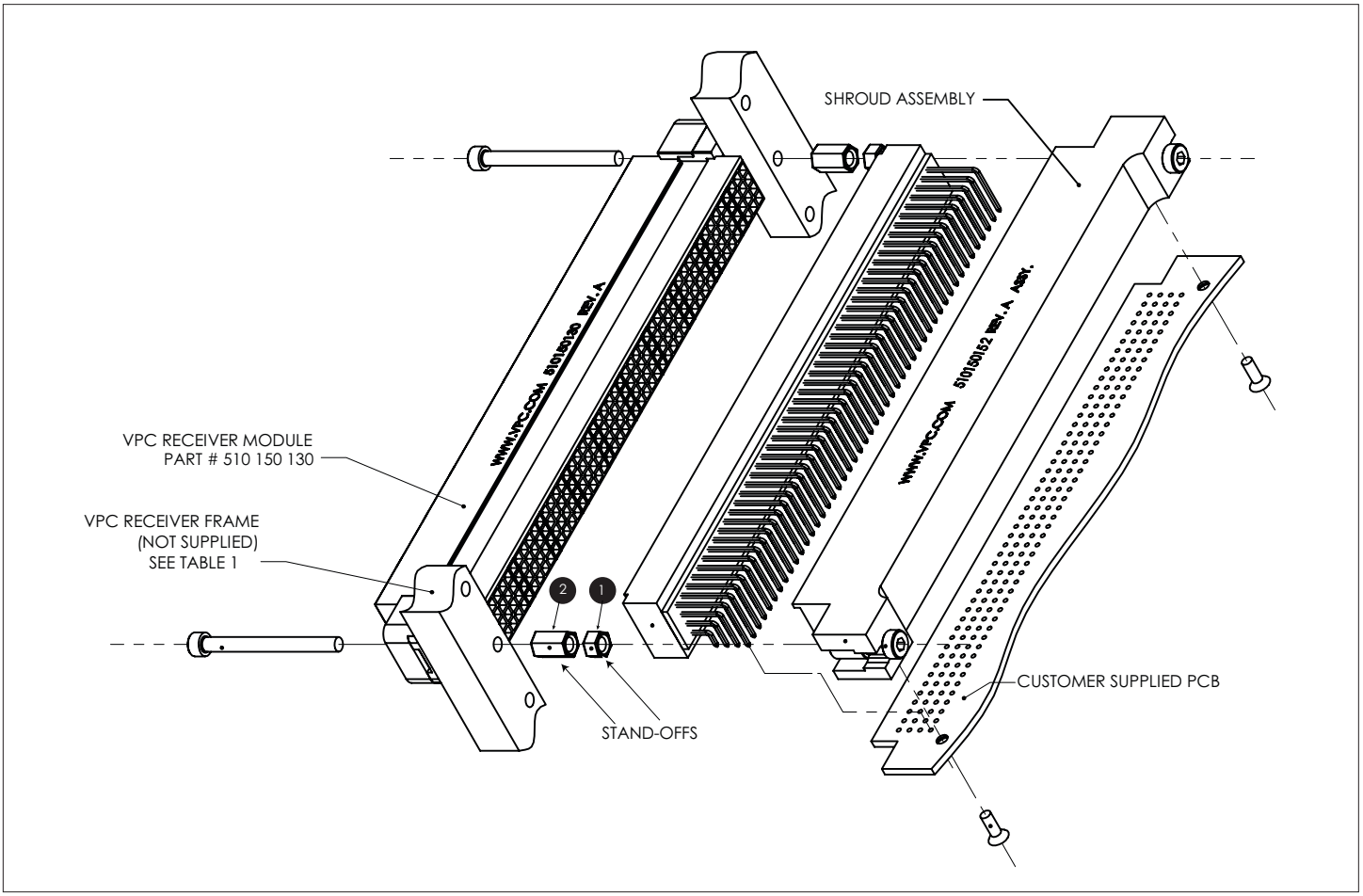


Figure B. Exploded view of assembly.

QUADRAPADDLE SIGNAL ITA PCB ADAPTER INSTALLATION AND REMOVAL

PART # 510 109 339 / 510 151 123 / 510 151 125

TOOLS REQUIRED
$^{3}/_{32}$ Allen Wrench

PCB ADAPTER INSTALLATION AND REMOVAL INSTRUCTIONS

1. Install the ITA module into the ITA frame with the two 4-40 double-ended studs. The long end of the stud should pass through the ITA module (**Figure A**). Ensure that Position 1 is located at the top for systems in which the modules are oriented vertically or to the left for systems in which the modules are oriented horizontally.

2. Align the PCB adapter's two threaded retaining sockets with the 4-40 double-ended studs (**Figure B**). Ensure that Position 1 on the adapter corresponds with Position 1 on the module.

3. Using the $^{3}/_{32}$ Allen wrench, carefully install the PCB adapter by tightening the retaining sockets, turning each no more than 1½ to 2 full revolutions before alternating to the other socket. Repeat this step until the PCB adapter is firmly engaged with the ITA module, taking care not to over-tighten. Torque screws to 4 in-lbs [0.45 Nm].

4. To remove the PCB adapter from the ITA frame and module, use the same alternating method of 1½ to 2 turns until the PCB assembly is fully disengaged.

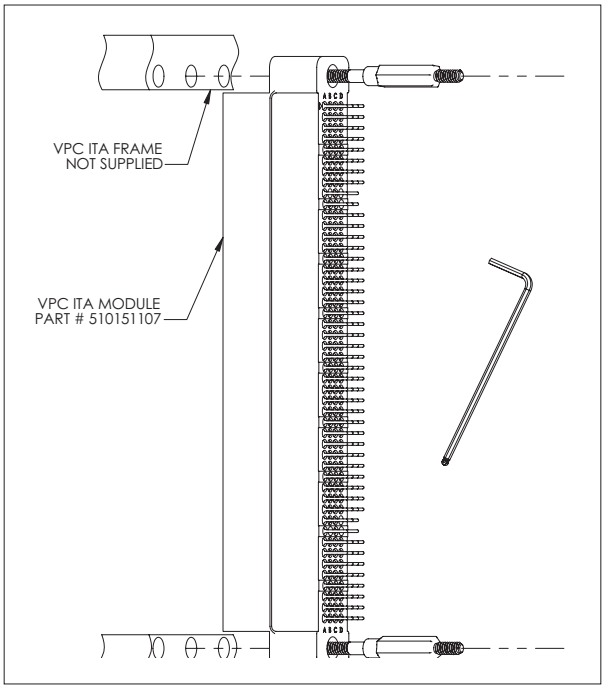


Figure A. Install ITA module into the ITA frame.

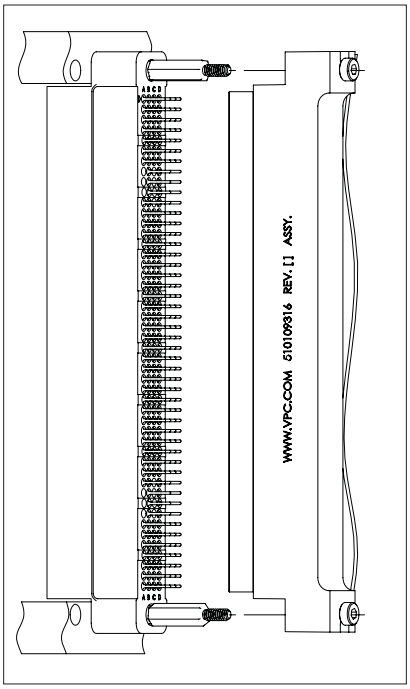


Figure B. Install the PCB adapter.

QUADRAPADDLE SIGNAL CUSTOM ITA PCB ADAPTER INSTALLATION/REMOVAL

PART # 510 151 121 / 510 109 316

TOOLS REQUIRED
3/32 Allen Wrench

PCB ADAPTER INSTALLATION AND REMOVAL INSTRUCTIONS

1. Solder the header to the PCB (IPC-A-610 standard is recommended for PCB design). The PCB must be manufactured with the header installation area complying with the recommended PCB layout (**Figure A**).

2. A post solder trimming operation is required to shorten the tails in order to eliminate interference between adjacent adapters or strain relief. Trim tails to length shown in **Figure B**. The dimension represents maximum length after trimming. Tails should be trimmed in accordance with IPC-A-610 standard section 6.5.1.

Continued on next page...

Dimensions shown: [millimeters]
inches

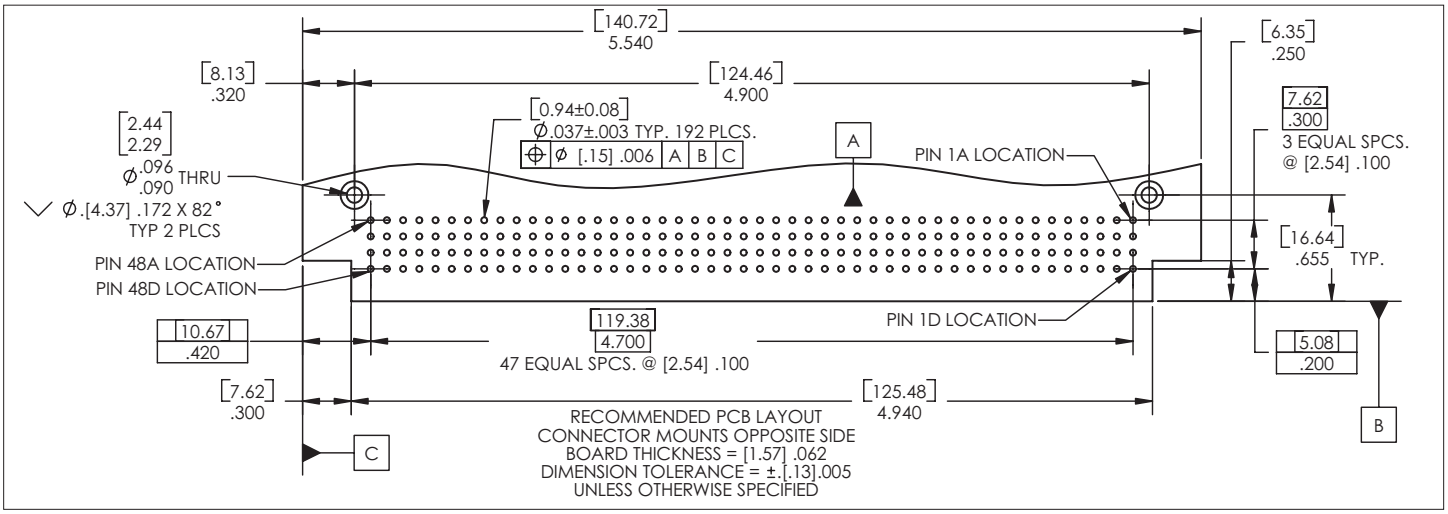


Figure A. Recommended PCB layout.

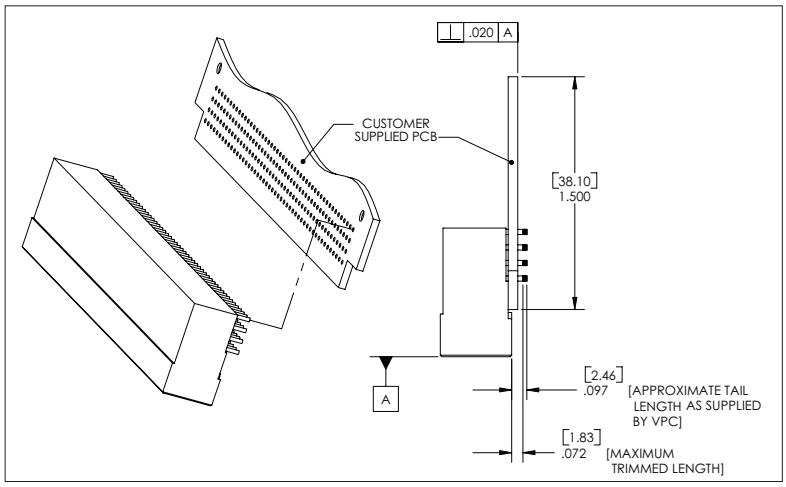


Figure B. Trim solder tails to length.

QUADRAPADDLE SIGNAL CUSTOM ITA PCB ADAPTER INSTALLATION/REMOVAL

PART # 510 151 121 / 510 109 316

PCB ADAPTER INSTALLATION AND REMOVAL INSTRUCTIONS, CONTINUED

3. Fasten the shroud assembly to the PCB using two 2-56 x .25" flat head screws (**Figure C**). Torque screws to 2 in-lbs [0.22 Nm].

4. Install the ITA module into the ITA frame with the two 4-40 double-ended studs. The long end of the stud should pass through the ITA module (**Figure D**). Ensure that Position 1 is located at the top for systems in which the modules are oriented vertically or to the left for systems in which the modules are oriented horizontally.

5. Align the PCB adapter's two threaded retaining sockets with the 4-40 double-ended studs (**Figure E**). Ensure that Position 1 on the adapter corresponds with Position 1 on the module.

6. Using the $^{3}/_{32}$ Allen wrench, carefully install the PCB adapter by tightening the retaining sockets, turning each no more than 1½ to 2 full revolutions before alternating to the other socket. Repeat this step until the PCB adapter is firmly engaged with the ITA module, taking care not to over-tighten. Torque screws to 4 in-lbs [0.45 Nm].

7. To remove the PCB adapter from the ITA frame and module, use the same alternating method of 1½ to 2 turns until the PCB assembly is fully disengaged.

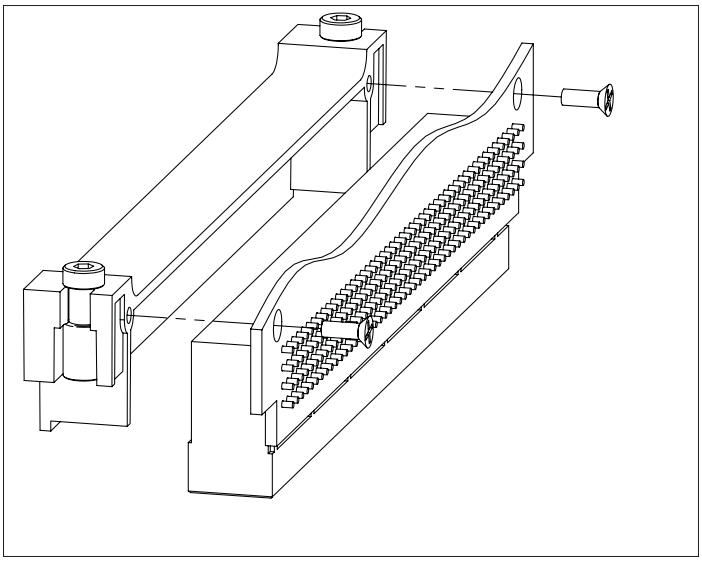


Figure C. Attach shroud.

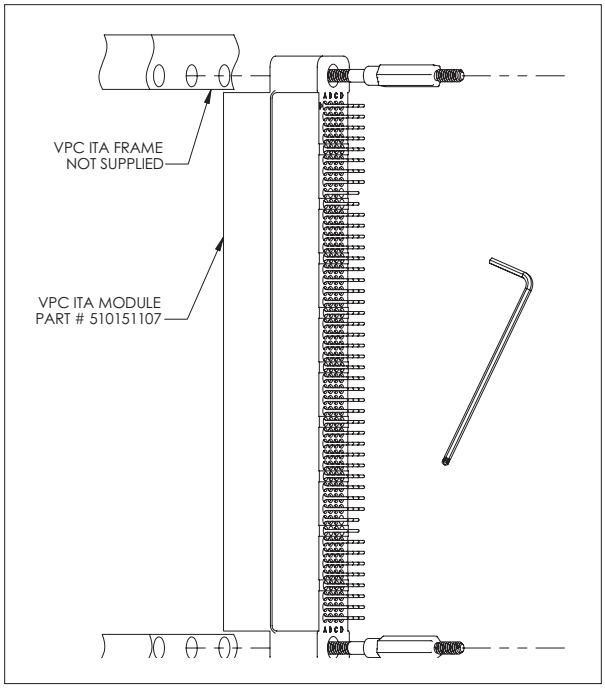


Figure D. Install ITA module into the ITA frame.

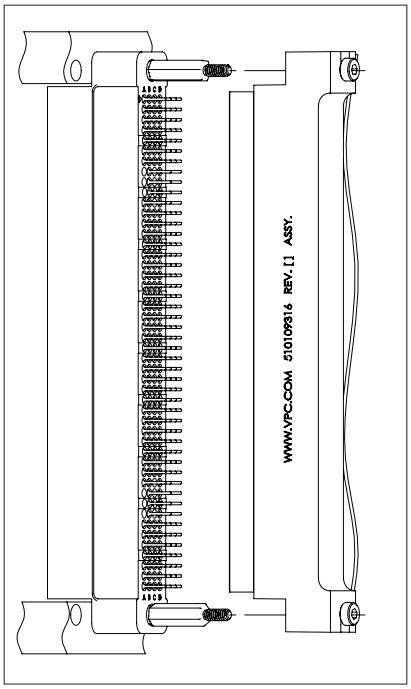


Figure E. Install the PCB adapter.

QUADRAPADDLE TWIN FEMALE/TWIN MALE MODULE TO PCB LAYOUT AND MOUNTING

PART # 510 150 130 / 510 150 137 / 510 151 107 / 510 150 131 / 510 150 135 / 510 151 108

Modules with twin female contacts can be used to connect directly to a PCB mounted male header (**Figure A**). Modules with twin male posts can be soldered directly to a PCB (**Figure B**). See **Figure C** for the recommended PCB layout for modules 510150130, 510150137, and 5101511107. See **Figure D** for recommended PCB layout for modules 510150131, 510150135, and 510151108.

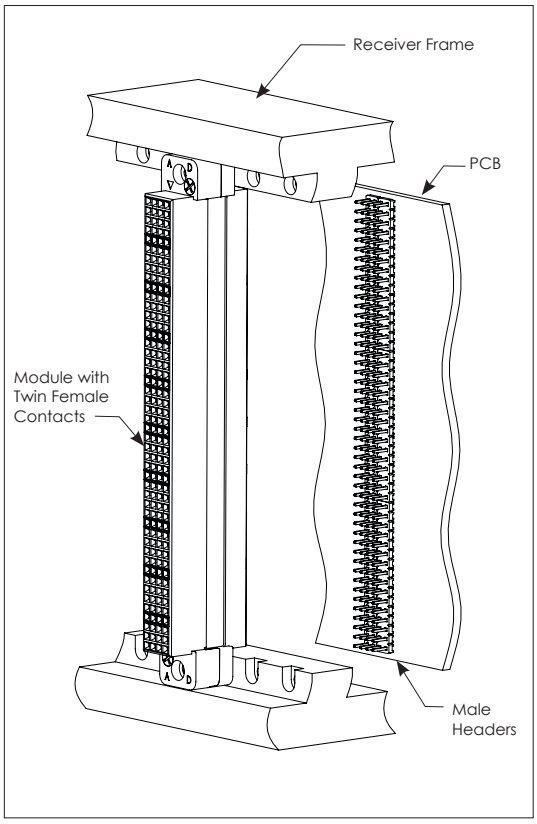


Figure A. Module with Twin Female contacts.

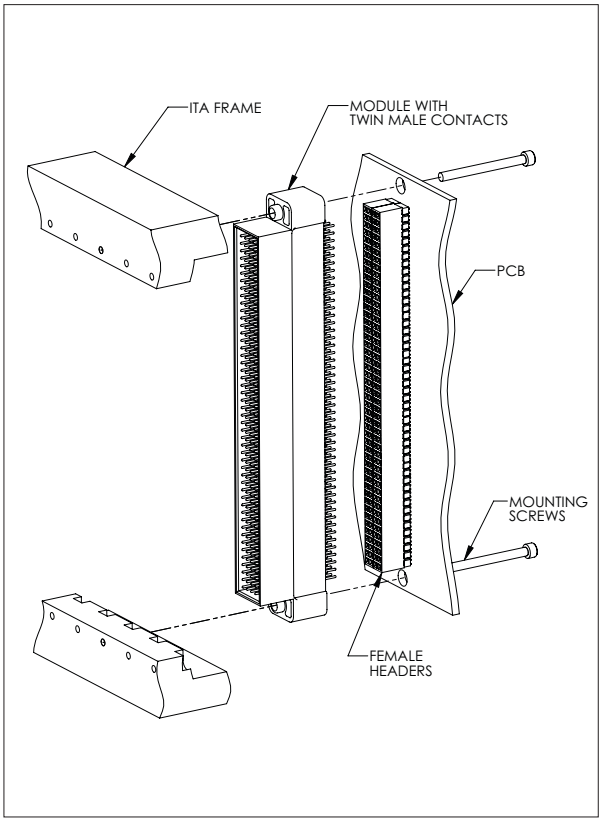


Figure B. Module with Twin Male contacts.

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QUADRAPADDLE DOUBLE FEMALE/DOUBLE MALE MODULE TO PCB LAYOUT AND MOUNTING

PART # 510 150 130 / 510 150 137 / 510 151 107 / 510 150 131 / 510 150 135 / 510 151 108

...Continued from previous page

Dimensions shown: [millimeters]
inches

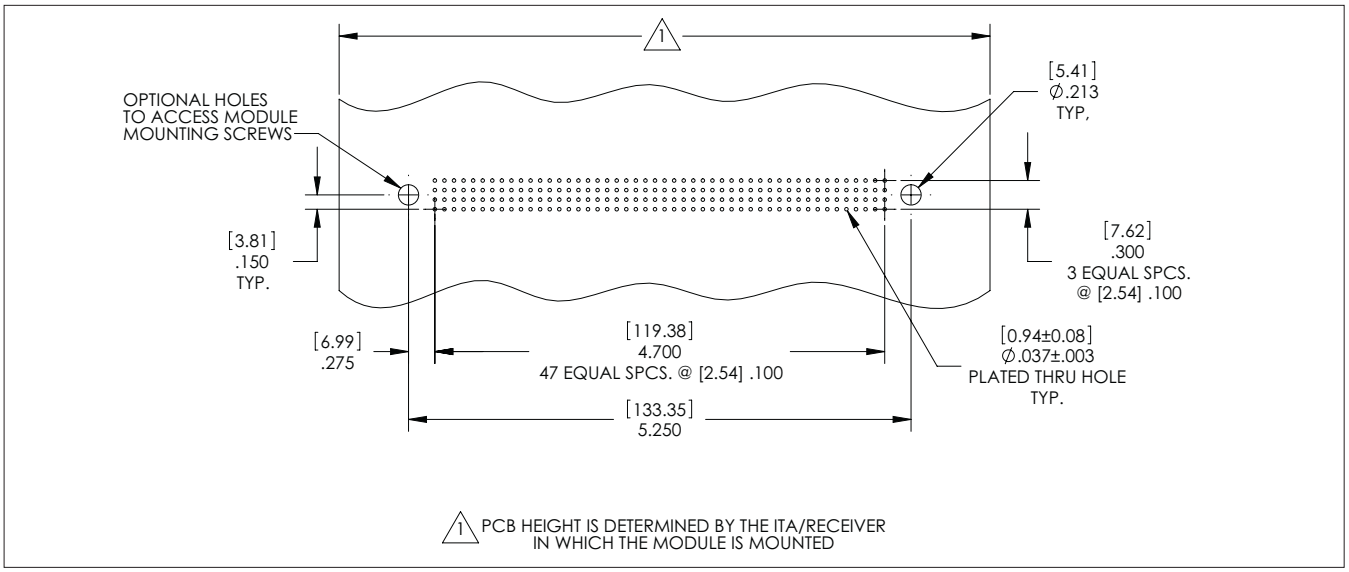

Figure C. Recommended PCB layout for modules 510150130, 510150137, and 5101511107.

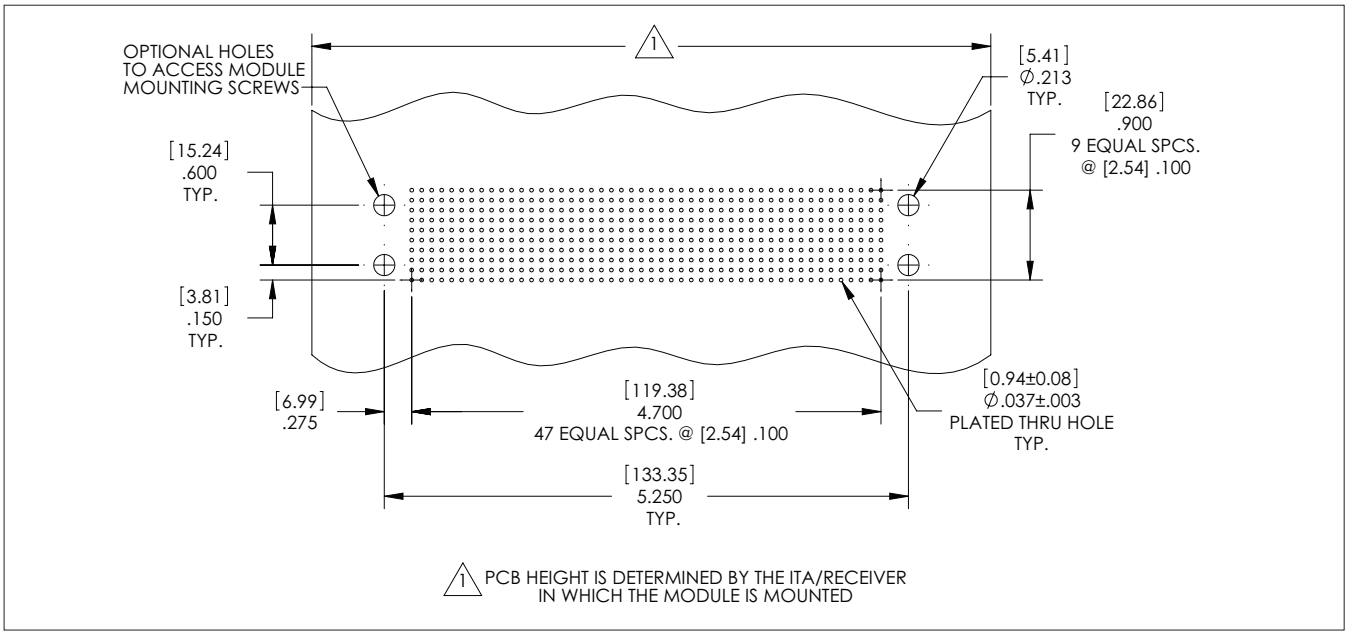

Figure D. Recommended PCB layout for modules 510150131, 510150135, and 510151108.

CROSS REFERENCE TABLES

	STANDARD/ 90 SERIES RECEIVER MODULES								CASS/ 80 SERIES RECEIVER MODULE	ICON RECEIVER MODULES					CRIMP TOOL	EXTRACTION
RECEIVER CONTACTS	510 150 115	510 150 116	510 150 130	510 150 131	510 150 135	510 150 136	510 150 137	510 150 147	510 114 131	510 160 101	510 160 102	510 160 105	510 160 107	510 160 112	910 101 125	910 110 112
610 138 100			X	X	X	X	X	X				X		X		
610 138 116	X	X							X	X	X		X		X	X
610 138 117*			X	X	X		X					X		X		
610 138 118*			X	X		X		X				X		X		

*May be used with Part # 610 138 100

	STANDARD/ 90 SRIES ITA MODULES						CASS/ 80 SERIES ITA MODULE	ICON ITA MODULES			CRIMP TOOL	LOCATOR	EXTRACTION	INSERTION
ITA CONTACTS	510 151 105	510 151 106	510 151 107	510 151 108	510 151 124	510 151 127	510 114 131	510 161 101	510 161 102	510 161 107	910 101 103	910 104 140	910 110 111	910 113 106
610 138 109	X	X					X	X	X	X	X	X	X	
610 138 112	X	X					X	X	X	X	X	X	X	
610 138 115	X	X	X	X				X	X	X			X	
610 138 122	X	X			X	X		X	X	X			X	X

Product Performance Specifications
QuadraPaddle Connector

1. Scope

1.1 Content

This specification covers the performance, tests and quality requirements for the QuadraPaddle Connector and connector system. This contact is a separable electrical connection device for mating to a .025 inch round or square post. The crimped type of contact can be used with 22 to 30 AWG wire sizes. QuadraPaddle contacts are to be used with connector modules with .100 inch centerline spacing.

1.2 Qualification Testing

When tests are performed on subject product line, the following procedures shall be used:
All inspections shall be performed using applicable inspection plans and product drawings. Upon completion of qualification testing, this specification will be assigned a number and be classified, as a Product Qualification Report which will be identified in section 2.

2. Applicable Documents

2.1 Content

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of a conflict between requirements of this specification and product drawing, product drawing will take precedence. In the event of a conflict between requirements of this specification and referenced documents, this specification shall take precedence.

2.2 Documents

A. EIA Standards
- EIA-264-05
- EIA-264-06
- EIA-264-09
- EIA-264-13
- EIA-264-17
- EIA-264-20
- EIA-264-21
- EIA-264-29

B. Qualification Test Plan
- 2003-116

C. Product Qualification Report
- VPC Test Report #2003-117
- VPC Test Report #2009-208

D. Product Drawings

Housings
- 510150130
- 510150115
- 510150105

Contacts
- 610138100
- 610138116
- 610138109
- 610138117

3. Requirements

3.1 Design and Construction

Product shall be of design, construction and physical dimensions specified on applicable product drawings.

3.2 Materials

A. Female Contact
   - Beryllium Copper
   - Gold over nickel plating

B. Male contact
   - Brass
   - Gold over nickel plating per MIL-DTL-45204D

C. Housing
   - Plastic, Glass filled, Liquid Crystal Polymer

3.3 Ratings

A. Voltage
   - AC
   - DC

B. Current
   - Low Level- See para. 3.5
   - 22 AWG: 5 ampere maximum
   - 28 AWG: 1.4 ampere maximum

C. Temperature
   - -50^{o}C to +105^{o}C

3.4 Performance and Test Description

Product is designed to meet electrical, mechanical, and environmental requirements specified in Figure 1. Unless otherwise specified, all tests should be performed at free air, room temperature, and ambient environmental conditions.

3.5 Test Requirements and Procedures Summary

	Test Description	Requirement	Procedure
Preliminary	Examination of Product	Meets requirements of product drawing	Visual, dimensional, and functional examination per applicable quality inspection plan
Electrical	Termination Resistance: Double Female Contact	25 mΩ maximum initial	EIA-364-06: Subject mated contacts assembled in housing to 50 mV maximum open circuit at 100 mA maximum. See figures 2 and 3.
		35 mΩ maximum final	
	Termination Resistance: Wire Crimped Contact	25 mΩ maximum initial	
		35 mΩ maximum final	
	Insulation Resistance	5000 MΩ minimum initial	EIA-364-21: Test between adjacent contacts assembled in housing at 500VDC
		1000 MΩ minimum final	
	Dielectric Withstanding Voltage	1500 VDC test voltage at sea level	EIA-364-20: Test between adjacent contacts at 0.5 mA
	Current Rating	30° C maximum temperature rise	Test temperature rise in housing loaded with contacts subjected to a variable current – see Figure 4
	Low Level	Voltage drop of ≤ 3 µV	EIA-364-06: Test signal of 5 mVDC at 100µA
	Bandwidth	Maximum rolloff of -3dB	DC to 1.2 GHz - see Figure 5
Mechanical	Durability	See test sequence: Figure 6	EIA-364-09: Mate and unmate sample for 20000 cycles
	Retention Force: Wire Crimp Contact	Contact shall not dislodge	EIA-364-29: Apply axial load of 3 lbs to contact
	Retention Force: ITA Contact	Contact shall not dislodge	
	Insertion Force: Wire Crimp Contact	Force to insert contacts into module ≤ 1.0 lbs	EIA-364-05
	Insertion Force: Double Female Contact	Force to insert contacts into module ≤ 2.0 lbs	
	Insertion Force: ITA Contact	Force to insert contacts into module ≤ 1.0 lbs	
	Mating Force	1.5 to 2.5 ounces force per contact using a Ø 0.025" round pin	EIA-364-13: Measure force necessary to mate samples at a normal rate of engagement of the ITA
	Unmating Force	≤ 2.5 ounces force per contact using Ø .025" round pin	EIA-364-13: Measure force necessary to unmate samples at a normal rate of disengagement of the ITA
Environmental	Temperature Life	See test sequence: Figure 6	EIA-364-17: Subject mated samples to temperature life at 105°C for 500 hours

Figure 1. Test Requirements and Procedure Summary

3.6 Termination Resistance Measurement Setup

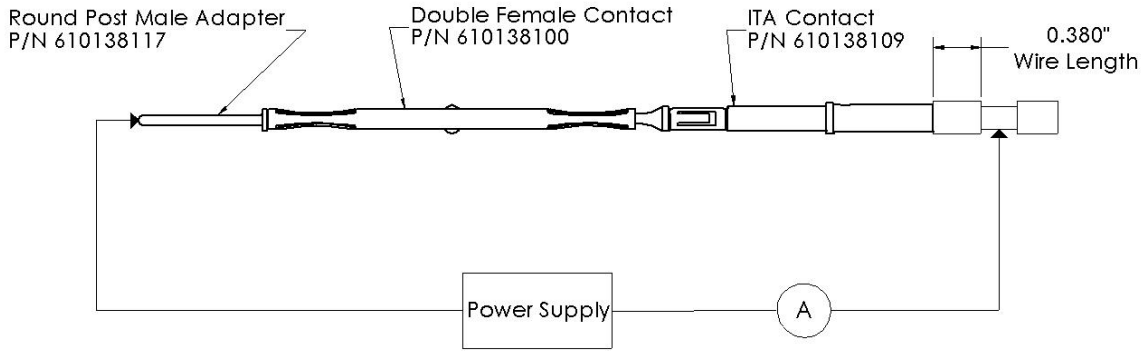

Figure 2. Termination Resistance Measurement Points - Double Female contact

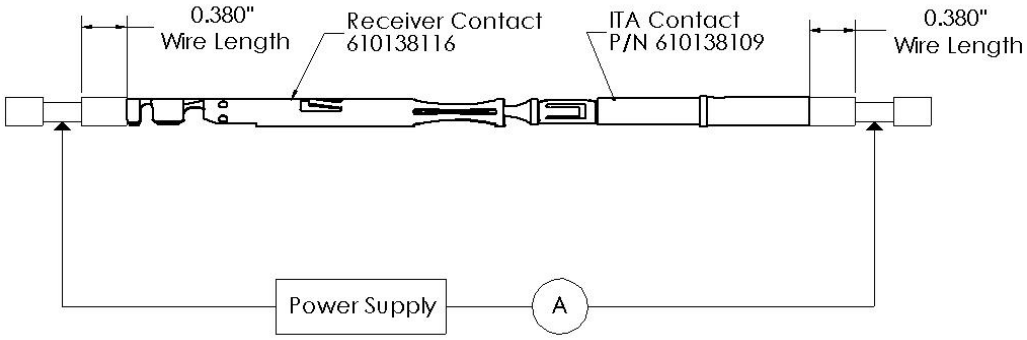

Figure 3. Termination Resistance Measurement Points - Wire Crimp Contact

3.7 Current Rating Graph

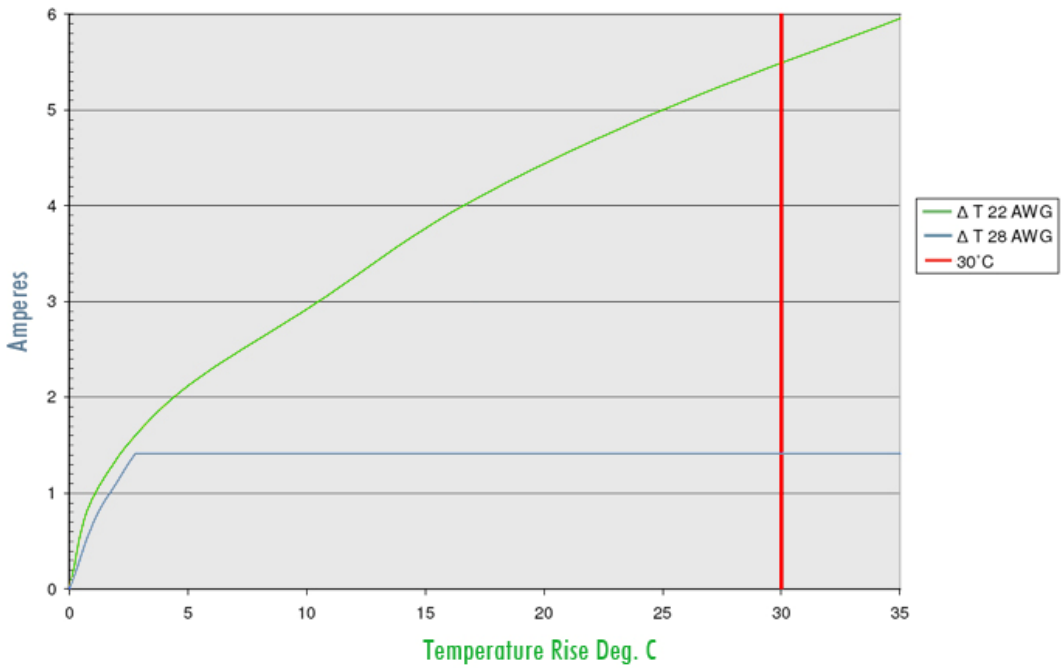

Figure 4. Temperature Rise vs. Current

3.8 Bandwidth Graph

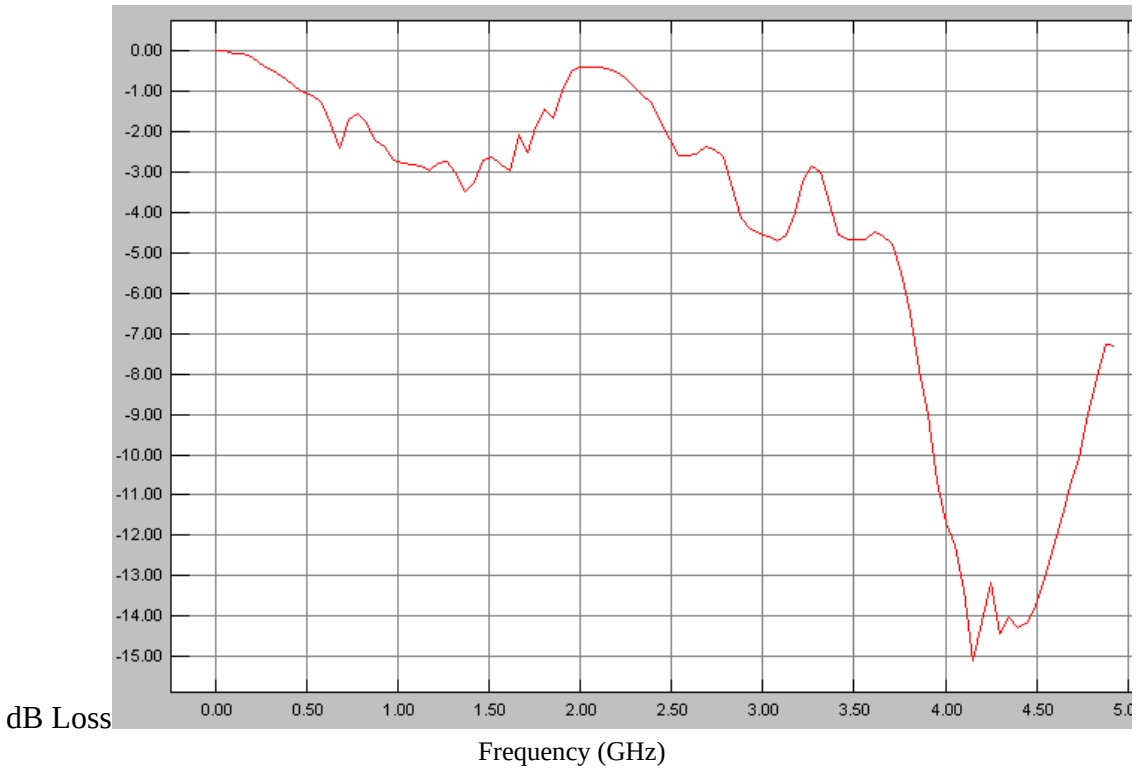

Figure 5. Male to Female QuadraPaddle connectors de-embedded (-3 dB at 1.2 GHz)

3.9 Product Qualification and Requalification Test Sequence

Test or Examination	Test Group				
	I	**II**	**III**	**IV**	**V**
Examination of Product	1, 7	1, 5	1, 4	1	1
Termination Resistance	3, 5	2, 4			
Insulation Resistance			2		
Dielectric Withstanding Voltage			3		
Durability	4				
Contact Retention				3	
Mating Force	2				
Unmating Force	6				
Temperature Life		3			
Current Rating			5		
Contact Installation Force				2	
Bandwidth					2

Figure 6. Test Sequence

Numbers indicate the sequence in which the tests are performed. For test group sample selection see 4.1 A.

4. Quality Assurance Provisions

4.1 Qualification Testing

A. Sample Selection

Samples shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. All test groups shall each consist of a minimum of 5 connectors containing at least 30 contacts total each and equal posts to mate with receptacles. Test group 1 shall have both minimum and maximum position size connectors.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 6.

4.2 Requalification Testing

If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of original testing sequence as determined by development/product, quality and reliability engineering.

4.3 Acceptance

Acceptance is based on verification that product meets requirements of Figure 1. Failures attributed to equipment, test set-up or operator deficiencies shall not disqualify product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4 Quality Conformance Inspection

A Certificate of Conformance (C of C) dimensional inspection must be completed for all samples prior to Qualification testing. The applicable quality inspection plan will specify sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with applicable product drawing and this specification.

Rev	Date	Rev Change	Prepared By
1	9/2/03	Original release	Darryl Ashby
2	1/22/08	Updated and Formatted	Eric Husted
3	1/23/09	Updated Current Specification	Eric Husted
4	6/30/09	Add Bandwidth Specification	Eric Husted
5	9/22/09	Updated	Eric Husted